Public Participation and Inclusion in Smart City Projects in Montreal

by Arina Chatigny-Vincter

A Thesis Submitted in Partial Fulfillment of the
Requirements for the Degree of B.A. Honours in Geography (Urban Studies)

Department of Geography McGill University Montréal (Québec) Canada

December 2020

Acknowledgements

First and foremost, I would like to thank my supervisor, Professor Renée Sieber, for her continued guidance, support and encouragement. Without her help, this project would have been impossible. I am extremely grateful for all the conversations we exchanged and her contagious academic curiosity. I would also wish to extend my thanks to Professor Raja Sengupta, who kindly accepted to be my thesis reader, and to Professor Sarah Turner and Professor Natalie Oswin, the program supervisors. An immense thank you to the participants who graciously shared their time and thoughts with me. I would also like to thank the Arts Research Internship Awards for funding this research. Finally, thank you to my family and friends for their invaluable support.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

Abstract

Across the globe, smart cities are increasingly popular. Whereas private sector firms argue that their products can bring more inclusive and participatory decision-making processes, academic research suggests that the benefits of smart city technology are less clear when we examine their implementation in the real world. This thesis seeks to investigate how participation and inclusion in smart city projects in Montreal, Canada, are defined and operationalized using semi-constructed interviews of government officials and document analysis of municipal government documents. For the purpose of this research, "participation" is defined as involvement in decision-making (Arnstein, 1969) and "inclusion" is defined the inclusion of different interests and viewpoints in participation (Head, 2007). While results were not entirely conclusive, investigating how participation and inclusion are defined and operationalized remains extremely important to the success of Montreal in creating smart urban solutions adapted to its reality.

Chapter 1: Introduction

1.1 Introduction

The term "smart city" encapsulates a wide range of trendy concepts and ideas, such as big data, artificial intelligence, 5G, autonomous vehicles, and more. Just in its name, the term is extremely appealing. How does not want to be smart? The smart city trend has gained momentum in Canada as well. Recent high-profile events, such as Google's smart city plan for the Toronto waterfront and the Smart Cities Challenge, a pan-Canadian competition, have put smart cities under the spotlight in Canada.

From an economic standpoint, the global smart city market is growing fast. It is expected to reach 252.96 billion USD by 2025 (Bloomberg Business, 2019). Private sector firms argue that their smart city products can offer transformative new insights to city managers, engineers, and planners. And some make even greater claims, asserting that by adopting smart technologies, governmental decision-making processes will be more open, accessible, and transparent (Wilhelm Siegfried Ruhlandt, 2018).

Yet, academic research suggests that the benefits of smart city technology are less clear when we examine their implementation in the real world (Dameri & Benevolo, 2016). Overall, many discrepancies emerge between the corporate smart city narratives and the ways in which cities adopt smart city technology. Large bodies of literature on smart cities have been focused on the technology, big data, and the infrastructure needed to analyze the data. However, little research, thus far, focuses on how Canadian smart cities are governed and planned.

Citizen engagement in cities is largely viewed as a beneficial process that enables better decision making from city planners and government officials (Brabham, 2009). In that regard, smart cities are no different and citizen engagement remains crucial to good governance (Castelnovo et al., 2016).

Figure 1: Montreal (Photo by author)

Montreal is an interesting city to look at on the smart city scene for its unique mix of vibrancy (Florida, 2004), knowledge economy (Moser, Fauveaud and Cutts, 2019) and desire to be a worldwide smart cities pioneer (Lauriault & al., 2018). Since the 16th century, Montreal occupies an important role in the economic Canadian landscape (Cooper, 1969) and for decades now, the city has been promoting and supporting its post-industrial shift to the knowledge economy (Moser, Fauveaud and Cutts, 2019). Montreal has been flagged as a dynamic city that has been successful in reinventing itself and developing a regional "creative" force (Florida, 2004). Montreal has maintained a presence on the smart city scene for some time now (Allwinkle & Cruickshank, 2011). In 2014, the metropolis launched its Smart and Digital City Office to

oversee Montreal's 2015–2017 Smart and Digital City Action Plan (LIUM, n.d.). Fast forward to 2018, the Montréal Urban Innovation Lab was born. Last year, the Canadian government launched the Smart Cities Challenge to "empowers communities to adopt a smart cities approach to improve the lives of their residents through innovation, data and connected technology" (Infrastructure Canada, 2020). Montreal won the challenge and was awarded $ 50 million from Infrastructure Canada (LIUM, n.d.). These initiatives exemplify Montreal's will to both continue on its smart city path and to create unique smart solutions adapted to its reality.

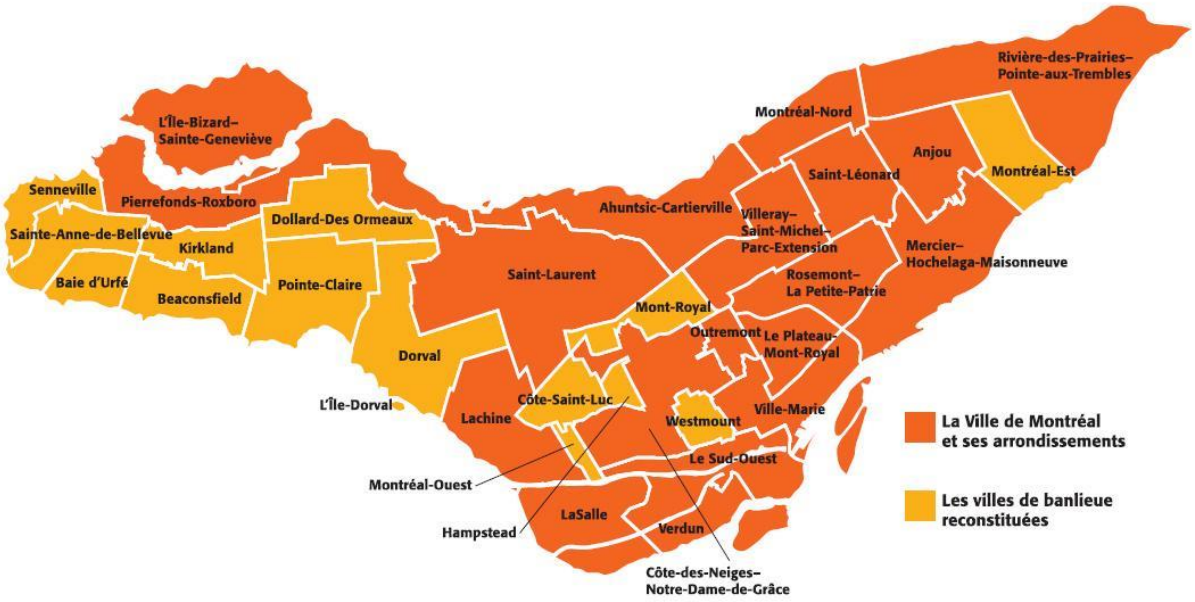

Figure 2: Map of Montreal, its boroughs in orange and the independent municipalities in yellow (Fiatlux, n.d.).

1.2 Thesis Aim and Research Questions

The aim of my research is: to investigate how participation and inclusion in smart city projects in Montreal, Canada, are defined and operationalized, and to examine what level of decision-making power the city residents will have over these projects.

My thesis is guided by two main research questions:

1. How is participation defined and operationalized in Montreal's smart city projects? To address this question, I provide an analysis of how people piloting smart city projects in

Montreal define participation, putting an emphasis on reporting the level of decision-making power citizens will have.

2. In Montreal's smart city projects, what is the role of citizen's data in participation and inclusion? To approach this question, I consider how the data is collected and how it is used by to inform participation and inclusion by people working on smart city projects in Montreal.

For the purpose of this research, "participation" is defined as involvement in decision-making (Arnstein, 1969). However, participation does not entail decision-making power (Arnstein, 1969), in other words, participation does not automatically produce influence on decision-making. Again, for the purpose of this research, "inclusion" is defined as the inclusion of different interests and viewpoints in participation (Head, 2007).

Chapter 2: Literature Review

In this chapter, I begin by looking at literature on civic participation. Then, I look at the literature on the smart city. I also explore inclusion in participation and data collection in the smart city and tie it back to my research questions

2.1 Civic Participation

It is hard to describe civic participation, which can range from a narrow definition, such as political participation, to a broader one encapsulating involvement in community life (Gauthier, 2003). In my thesis, I draw on Gauthier and do not confine the definition of public participation to participation in the electoral process (Gauthier, 2003).

The literature on civic participation looks at the way stakeholder interests are integrated, or not, into decision-making (Bieckerstaff and Walker, 2001, Roberts, 1997, 2004; Rowe & Frewer, 2000; Welch, 2012). Participation has strong normative foundations (Welch, 2012); in other words, Welch (2012) would say that more participation is better. Arnstein (1969) would argue that simply having more participation does not necessarily equates more citizen power.

> The idea of citizen participation is a little like eating spinach: no one is against it in principle because it is good for you. Participation of the governed in their government is, in theory, the cornerstone of democracy—a revered idea that is vigorously applauded by virtually everyone. The applause is reduced to polite handclaps, however, when this principle is advocated by the have-not Blacks, Mexican Americans, Puerto Ricans, Indians, and whites. And when the have-nots define participation as redistribution of power, the American consensus on the fundamental principle explodes into many shades of outright racial, ethnic, ideological, and political opposition. (Arnstein, 1969, p.216)

To this day, Arnstein's (1969) research on citizen participation in government policy making remains a reference in the field (Quetzal Tritter & McCallum, 2006). Arnstein famously argued that "[t]here is a critical difference between going through the empty ritual of participation and having the real power needed to affect the outcome of the process" (Arnstein, 1969, p. 176). For my thesis, this difference is extremely important as it highlights that the smart city projects must not to equate participation with real citizen power, as participation does not automatically generate influence on decision-making (Arnstein, 1969). Participation is necessary but not sufficient for the city residents to obtain decision-making power in the smart city projects.

Arnstein (1969) further fleshed out eight different types of participation in a ladder illustration (see figure 3), representing the degrees of citizen power in determining the outcomes of a planned project. The eight types are grouped into three levels: non-participation, degrees of tokenism and degrees of citizen power (Arnstein, 1969). For Arnstein (1969, p. 216), "participation without the redistribution of power" from power holders to citizens allows the powerful to falsely claim that all sides were considered while maintaining the status quo.

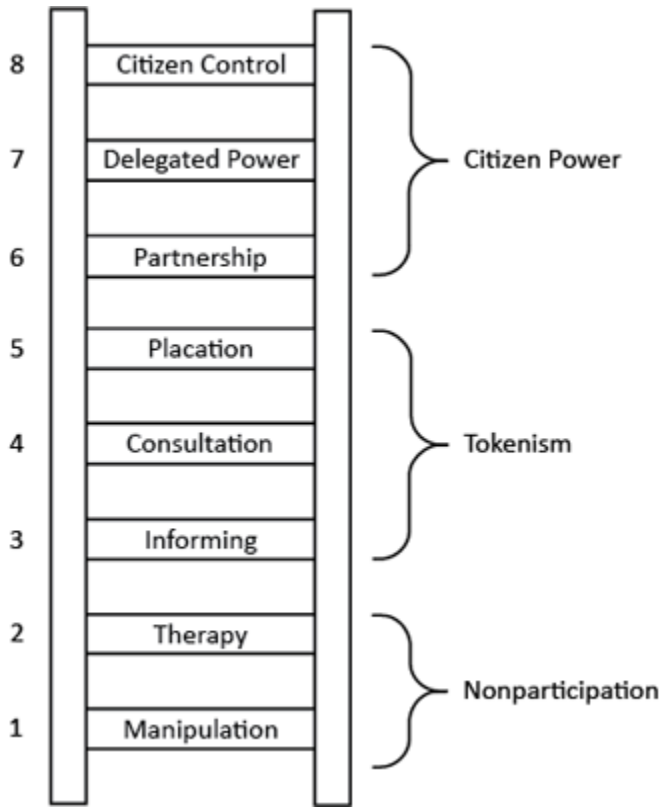

Figure 3: Arnstein's Ladder of Citizen Participation (Arnstein, 1969)

In her ladder of citizen participation, citizen power grows as members of the public climb the ladder (Arnstein, 1969). The bottom two rungs of the ladder (manipulation and therapy) represent "non-participation" and are designed by power holders with explicit malicious intent to substitute real participation and "cure" the participant of their opposition (Arnstein, 1969). The third (informing) and the fourth (consultation) rungs ascend to "tokenism" as a form of participation. The fifth rung (placation) remains tokenism as citizens can advise, but they have no assurance that their advice will be taken into account (Arnstein, 1969). Nonetheless, informing the citizen of its rights, responsibilities and alternatives is a first step towards veritable citizen participation (Arnstein, 1969). In the upper rungs of the ladder, citizens gain power with increasing degrees of decision-making (Arnstein, 1969). At the sixth rung (partnership), citizens can begin to engage in trade-offs and negotiate with power holders (Arnstein, 1969). At the very top of the citizen participation ladder lies delegated power (7) and citizen control (8), in which citizens take control of the majority of decision-making seats or, in other words, "full managerial power" (Arnstein, 1969, p.217). I will use Arnstein's (1969) ladder to help me answer my first

research question about how participation is defined and operationalized in Montreal's smart city projects. I will use her ladder to assess the level of decision-making power citizens will have in each project.

Arnstein's ladder is not the only tool that I will use to answer my first research question. I will also draw on the work of the International Association for Public Participation (IAPP), which has summarized and categorized much of the literature on forms of participation and community involvement (Head, 2007; IAPP, 2005). The IAPP (2005) identified five main types of participation (see figure 2). From weakest to strongest, they are as follow: informing, consulting, involving, collaborating and empowering citizens (IAPP, 2005). The IAPP (2005) further associates each type with a clear public participation goal, an implicit promise to the public and examples techniques. The IAPP's (2005) table is similar to Arnstein's ladder (1969), if you remove the non-participation category (manipulation and therapy) but I wanted to include it as well, as it provides me with more tools to assess for my inquiry. I will use these two "classifying tools" to provide me with valuable language and ideas against which I can compare my interviews to determine the level of decision-making power citizens will have (Arnstein, 1969), the form of public participation in the project, the public participation goal of the project and its promise to the public (IAPP, 2005). I will also look for mentions of the techniques to consider (see figure 4). All this will aid me inquire about how participation is defined and operationalized in Montreal's smart city projects, which is the first research question of this thesis.

Forms of participation	**Public participation goal**	**Promise to the public**	**Example techniques to consider**
Inform	To provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions.	We will keep you informed.	Fact sheets, websites, open houses

Consult	To obtain public feedback on analysis, alternatives and/or decisions.	We will keep you informed, listen to and acknowledge concerns and aspirations, and provide feedback on how public input influenced the decision.	Public comment, focus group, surveys, public meetings
Involve	To work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered.	We will work with you to ensure that your concerns and aspirations are directly reflected in the alternatives developed and provide feedback on how public input influenced the decision.	Workshops, deliberative polling
Collaborate	To partner with the public in each aspect of the decision, including the development of alternatives and the identification of the preferred solution.	We will look to you for direct advice and innovation in formulating solutions and incorporate your advice and recommendations into the decisions to the maximum extent possible.	Citizen advisory committees, consensus building, participatory decision-making
Empower	To place final decision-making in the hands of the public.	We will implement what you decide.	Citizens' juries, ballots, delegated decisions

Figure 4: Summary and categorization of public participation by the IAPP.

Source: International Association for Public Participation (2005). The table was obtained via Head (2007) and subsequently reformatted by me.

2.2 The Smart City

I begin by doing a literature review on the smart city to better understand what a smart city is, why it represents a novelty in citizen engagement and what is the global context in which smart cities emerge as interesting urban solutions.

In the literature, there is no widely agreed upon definition (Caragliu et al., 2009; Hollands, 2008; Lombardi et al., 2012). The smart city literature largely accepts technology is a necessary but insufficient component of the smart city (Caragliu et al., 2012; Choubari et al., 2012; Hollands, 2008; Lombardi et al., 2011). Sarma (2016, p.10) writes that:

> the premise of a smart city is that by having the right information at the right time, citizens, service providers and city government alike will be able to make better decisions that result in increased quality of life for urban residents and the overall sustainability of the city.

Through an in-depth literature review, Albino et al. (2015), found the description of a smart city to be multifaceted, including not only Information and Communications Technology (ICTs) but people and communities as well. Albino et al. (2015), adapted Lombardi et al. (2012), defined the smart city as a collection of components: economy, people, governance, mobility, environment and living. In a similar vein, Meijer and Bolivar (2016) identified three smart city literature strands: technical, human resources and governance. Choubari et al. (2012) stressed that the smart city aims to solve problems that are technical, physical and material (e.g., waste management, air pollution, traffic.) and problems are more social and organizational in nature (e.g., crime, inequality). To be solved by the smart city, those problems that are more social and organizational in nature must involve the participation of citizens (Choubari et al., 2012).

Despite a lack of universal definition amongst scholars, the smart city movement is popular and, in practice, often coined in tech-centric terms that imply that the smartness comes from technology: hardware, software, and data. Indeed, across the globe, the smart city movement prompts local governments to emphasize the harvesting of data (Lombardi & al., 2012; Brauneis and Goodman, 2018). Academics and practitioners have promoted ICT as a powerful instrument to enhance public participation (Granier and Kudo, 2016). Citizen engagement, a term that

includes civic participation, emerges as a vital element of smart cities (Castelnovo et al., 2016) as making cities smarter requires the sharing of visions and strategies between citizens and decision-makers (Nam & Padro, 2011).

2.3 Citizens as Sensors, Active and Passive Data

ICTs, including sensors, have the potential to increase the number of participants and to reach individuals that are unwilling to participate in traditional forms of citizen engagement such as townhalls (Castelnovo et al., 2016). I now focus on sensors in my literature review because, as elements of the smart city, they bring in new possibilities in conceptualizing participation and inclusion. Citizens can be considered as sensors, a term coined by Goodchild (2007). Goodchild (2007, p.218) identifies three types of sensors networks: static inert sensors, sensors carried by humans, vehicles or animals and sensors "that consists of human themselves", each with senses and intelligence. Although Goodchild's (2008) research focuses on citizens whose actions are voluntary and consensual, which might not be the case in my research, all three of Goodchild's (2007) sensors type are useful to my thesis, especially my second research question which focuses on the role of city residents' data collected in smart city projects in participation and inclusion. Armed with Goodchild's ideas, I can consider the citizens as being able to not only give data to static sensors and carrying sensors, but also as sensors themselves. I am interested in finding out if the differences between the three types of sensors are, in Montreal's smart city projects, linked to the role of citizen's data in participation and inclusion. For example, if the citizen is being sensed (e.g., by a sensor counting the number of people on a given street), it is different than if the citizen's sensor capabilities are being used (e.g., by asking the citizen which street the city should repair first) in terms of what is considered participation (with various levels of decision-making power) or inclusion in terms of geographic inclusion (where are the sensors located in the city) or socio-economic inclusion (inclusion of marginalized people), and more.

I now present two types of data, because they bring provide me with ideas that I can use to answer my second research question, which is about the role of citizen's data in participation and inclusion. First, we have active data. Active data is data you have to ask the user to gather, you cannot gather active data without the user's consent or intent. Second, we have passive data, which is data collected without active participation from the participant. Collection without

consent is possible. Consent here used not in any legal or ethical way, but rather in the sense of action or participation. While both active and passive data collection are possible without the smart city technologies, the collection of passive data on such a scale, as part of a public participation and/or inclusion effort, is part of the novelty of smart city data (Castelnovo et al., 2016). Exploring passive and active data collection prompts questions of consent. Not much has been written on passive and active consent procedures in geography, but the concept has been explored by researchers in the context of passive and active parental consent procedures. In that context, researchers draw a distinction between "passive consent procedure" where the parent is assumed to consent unless action is taken and "active consent procedure", where the parent is assumed not to consent unless action is taken (Pokorny et al., 2001).

Passive data collection has advantages, it can significantly increase the sample size of the number of participants and reduce the respondent's burden (Chen et al., 2010). As an example, in transportation research, passive data collection methods offer numerous benefits compared to conventional self-reported surveys, and consequently may supplement or even replace the former (Chen et al., 2010). Other examples include researchers using passive mobile positioning data to study tourism, transport and urban studies (Ahas et al., 2008). The vocabulary of active and passive citizen participation is used by IBM when describing citizens' participation in the process of the smart city (Sajhau, 2019). I tie in active and passive data to my thesis through my second research question, which seek to explore the role of citizen’s data in participation and inclusion. I try to see if the type of data, active or passive, used in the smart city projects, influences how participation and inclusion are defined and operationalized.

2.4 Critiques of the Smart City

I now turn to some critiques of the smart city to highlight why citizen participation and inclusion matter in smart city projects. Some academics have been particularly critical of the smart city rhetoric claiming it is the newest iteration of urban entrepreneurialism. Wiig (2015) argues that the smart city narrative is the latest form of entrepreneurial governance, in line with how Hollands (2008) understood smart cities as a high-tech version of Harvey's (1989) urban entrepreneurialism. Wiig (2015) scrutinized the work of IBM (2015), temporally situating the hype surrounding smart cities as the result of the 2008 global financial crisis. He further argued

that the desire to work with IBM streamed from the imperative for cities to appear innovative and competitive to attract global capital. In the end, the smart city initiatives in themselves mattered less than their capacity to increase a city's visibility on the global scene, in other words, presenting themselves as attractive urban centers for corporations was the primary appeal of smart cities initiatives (Wiig, 2015). In this line of thought, Wiig (2015) argues that the smart city rhetoric serves to "sell" a city in the global economy rather than to address issues that matter to city residents. Hollands proposes to "unwrap" the smart city label by identifying the "underlying emphasis on business-led development" (Hollands, 2008, p.308), shedding light on potential contradiction and diverging interests of social inclusion, environmental sustainability and the imperatives of capital accumulation. Thus, if the smart city really wants to tackle issues that are important for its citizens, Shelton and Lodato (2019) argue it is crucial that we hear from citizens themselves. In other words, we need citizens to participate and we need a diversity of different interests and viewpoints to be included (Head, 2007). The critiques of the smart city are important to my thesis as they highlight why citizen participation and inclusion are important in smart city projects.

2.5 Inclusion

The inclusion of marginalized people in civic affairs is largely recognized as crucial (Kelly, 2009). For the purpose of my research, I have defined "inclusion" as the inclusion of different interests and viewpoints (Head, 2007). I now take a look at why the inclusion of different interests and viewpoints, particularly from the disadvantaged or the haves-not (Arnstein, 1969), is important in the context of my thesis.

It is important that citizens feel included from the start in the decision-making process, otherwise there will be little incentives for them to participate in it (Quick and Feldman, 2011; Kelly, 2009). Secondly, it is important to actually include the citizens into the decision-making process because their inclusion allows for to a better understanding of complex social and environmental issues (Head, 2007).

2.6 Conclusion

In this chapter, I have reviewed the literature on civic participation. I found that all forms of participation are not equal (Arnstein, 1969) and I obtained two classifying tools, Arnstein's ladder and the IAPP's table, that will help me identify the level of decision-making power citizens will have in Montreal's smart city projects. Then, I reviewed the literature on the smart city and discovered that while there is no set definition of the "smart city", citizen engagement, a term that includes civic participation, is a vital element of smart cities. I then proceeded to focus on sensors, because as elements of the smart city, they bring in new possibilities for conceptualizing participation and inclusion. With Goodchild's (2008) ideas, I am now able to consider citizens as able to give data to sensors, carry sensors, but also as sensors themselves. For my thesis, I am interested in finding out if the differences between the three types are linked to the role of citizen's data in participation and inclusion, which is my second research question. Next, I presented two sorts of data, active and passive, that will also be used to answer my second research question. I followed by looking at some critiques of the smart city. I found that, if the smart city really wants to address issues that are important for its citizens, it is crucial to hear from citizens directly, as smart city initiatives can have a tendency to favorize other interests than those of the city residents. Finally, I looked at why the inclusion of different interests and viewpoints, particularly those of marginalized people, is important to my thesis.

Chapter 3: Methodology

To conduct my research, I relied on two qualitative data collection methods: semi-structured interviews and document analysis. I plan to use both methods in to answer my research questions. I then proceeded to code my data. At the end of this chapter, I present some notes on ethical considerations and my positionality as a researcher.

My research is qualitative, and I choose interviews as a method to answer my research questions because most of the smart city projects in Montreal are not yet completed. I decided to use interviews, which are a research method used to find out from people things that the researcher cannot directly observe (Hannabuss, 1996). In addition, interviews are often used by researchers when they seek to "extract meaning" (Hannabuss, 1996), so I chose this method as it seemed adequate for my own research.

I supplemented by interviews by doing document analysis, which provides me another method and data source to support my eventual research findings. Document analysis if often used in conjecture with other research methods to help support the credibility of research findings (Bowen, 2009). I chose document analysis as my complementary methods because document analysis consists of data selection instead of data collection. My first method, interviews, consist of data collection and is time consuming (Bowen, 2009). In the interest of time, I chose a complementary method that is data selection, which is less time consuming than data collection (Bowen, 2009).

3.1 Interviews

In qualitative research, researchers can employ three interview formats: unstructured, semi-structured, and structured (Dunn, 2000). For my research, I decided to do semi-structured interviews. To conduct the semi-structured interview, the research has to have a set of predetermined questions, often referred to as an interview guide (Clifford et al., 2010). Whereas structured interviews are rigid in format; semi-structured interviews are flexible and generally carried in a conversational manner (Clifford et al., 2010). The semi-structured format allows the extraction of subtleties and information that would otherwise be lost in a structured format

(Dunn, 2000). To utilize semi-structured interviews, I developed an interview guide with a range of questions (Dunn, 2000; Clifford et al., 2010).

I developed an interview guide covering 27 open-ended questions and thirteen Likert scale questions. The questionnaire was developed in English and subsequently translated in French to get a French version. A Likert scale, in its standard format, consists of statements to which a participant indicates a degree of agreement or disagreement using the following options: strongly agree, agree, neither agree nor disagree, disagree, strongly disagree (Albaum, 1997). The questionnaire, in English and in French can be found in the Appendix.

There were six main sections to my questionnaire: (1) introduction, (2) civic participation, (3) inclusion, (4) data, risks, challenges and benefits and (5) vision of the smart city. The interview guide was tested with four people (twice in French and twice in English) prior to the real interviews to obtain a time approximation. The average tested time for the interview varied between 20 and 30 minutes. The actual time it took for each interview varied greatly from one interview to the next, ranging from 33 minutes to over 1 hour and 15 minutes. I am unsure why there was this variation. I think that the longer the interview, the more the participant could go in-dept in their answers, thus creating potential biases.

Figure 5: Montreal's city hall under construction (photo by author)

The participant population initially targeted was adults currently employed by the City of Montreal and whose profession or expertise is linked to smart city initiatives. I chose participants based on public governmental online information (e.g., X is in charge Y in a given project) and their importance in piloting smart city initiatives in Montreal. I also was interested in members of civil society organizations implicated by or involved in the Smart Cities Challenge proposal. Montreal won the Smart Cities Challenge, a pan-Canadian competition organized by the federal government to "empowers communities to adopt a smart cities approach to improve the lives of their residents through innovation, data and connected technology" (Infrastructure Canada, 2020). I did not get to interview all the people I targeted. I interviewed ten participants for a total of eight interviews. In Table 1, I present a description of my participants. The interviewees S3 and F5 were both accompanied by someone else for the interview. In both cases, the principal interviewee, with whom the interview was scheduled, answered most questions. Since the other person only interjected from time to time, I treated it as one single interview. I conducted the

interviews in the interviewee's language of preference. The questionnaire and the participant consent form were both available in either French or English. Six of the interviews were recorded and conducted in person. One interview (W6) was done over the phone and this participant declined to be recorded. Another one (C7) was conducted over video conference, but due to technical difficulties, was lost. There is no audio file and no transcript for this interview (C7).

Table 1: Description of my interviewees

Interview ID	**Description**	**Location**	**Date**	**Language of the interview**
A1	Director of urban innovation – Works for the city of Montreal.	Montreal City Hall (temporary location due to renovations), Montreal, Quebec	August 12, 2019	French
B2	Director of an urban interdisciplinary center	A research university in Montreal, Quebec, Canada	September 11, 2019	French
D4	Co-founder of non-profit business center focused on innovation	Their locals - Montreal, Quebec, Canada	September 18, 2019	French
E1	Executive director at interdisciplinary non-profit with smart city experience accompanied by a researcher	Their locals - Montreal, Quebec, Canada	January 27, 2020	English
F5	Consultant working on data management – Works for the city of Montreal.	Th Their locals - Montreal, Quebec, Canada	October 29, 2020	French

S3	CEO of a non-profit mobility company accompanied by a strategy director	Their locals - Montreal, Quebec, Canada	September 23, 2019	French
G6	Senior team lead for a dockless vehicles company	No location – Phone interview	August 15, 2019	English
C7	Researcher involved in the development of a living lab focused on the issue of smart city and civic engagement.	No location – Video conference interview	August 10, 2020	French

Participants were first contacted via email and, if they replied positively, a follow-up email was sent along with the consent form and the questionnaire. If they agreed to participate, we agreed on a time and place for the interview. If they declined to participate, I asked if they had any recommendations or suggestions of people to talk to. This process is known as the snowball sampling (Walters, 2015).

The interviews were recorded on my smartphone. They were then transferred to a cloud storage and cloud computing service. From the cloud they were downloaded to my laptop and uploaded to Amazon Simple Storage Service (AWS 3). From there I used Amazon Transcribe (AWS Transcribe), an automatic speech recognition tool to obtain a transcription as a .json file. With the help of GitHub, I then used a few Python lines to get a Microsoft Word Document of the transcript. I chose to edit my transcription using "intelligent verbatim transcription" (see Table 1). This type of transcription involves transcription with detailed editing and minor paraphrasing to achieve a transcript that is fluid and easy to read (IndianScribes, 2018). I then proceeded to edit the transcripts to accurately reflect what the participant has said, as AWS Transcribe is not perfect and had trouble understanding the Quebec accent.

Table 2: Intelligent verbatim transcription

Included	**Non-Included**
Everything that is said during the interview	Grammatical errors, fillers, stutters, false starts (incomplete sentences), repetitions, non-verbal communication and ambient sounds.

I began my analysis by pre-coding my data by circling, highlighting and underlying quotes or passages (Boyatzis, 1998) on paper. Those passages were informed by my review of the literature. I read all of the interviews making margin notes (Holton, 2010). Then, I proceeded to code my data to find codes, subcategories and categories (Clifford et al., 2016). Processing the data manually and on paper is advised for first-time researchers and research that is of a small scale (Saldana, 2009). I started by coding each interview separately. Following that process, I grouped my responses and began to rework my codes, subcategories and categories, in a cyclical manner (Saldana, 2009). My codes, subcategories and categories are as follow.

Category 1: Participation

Subcategory: Composition of participants	Subcategory: Reason for participation
Code: Age group	Code: Helping city save money,
Code: Socio-economic group	Code: Being a better citizen
Code: Geographic location	Code: Better life quality
Code: Ethnic group	

Category 2: Inclusion

Subcategory: Criteria to inclusion	Subcategory: Criteria for exclusion
Code: Geographic inclusion	Code: No geographic inclusion
Code: Socio-economic inclusion	Code: No socio-economic inclusion
Code: Access to technology	Code: No access to technology, digital divide
Code: Diversity of participants	Code: No diversity of participants

Category 3: Public

Subcategory 1: Direct users	Subcategory: Citizen	Subcategory: Everyone
Code: Client	Code: City citizen	Code: Everyone
Code: User		

Category 4: Definition of a smart city

Subcategory: Technology	Subcategory: Benefits	Subcategory: Governance
Code: Hardware	Code: Common good, heighten quality of life	Code: Speed for decision-making
Code: Software	Code: People will want to be more engaged	Code: Data driven decisions
Code: Data collection	Code: Does not just rely on automated decision-making/tech	Code: More transparency, accountability

		Code: More citizen participation, citizen engagement

Category 5: Levels of participation (based on Arnstein's ladder)

Subcategory: Citizen power Code: Citizen control Code: Delegated power	Subcategory: Tokenism Code: Placation Code: Consultation Code: Informing	Subcategory: Nonparticipation Code: Therapy Code: Manipulation

Category 6: Barriers to participation

Subcategory: Surveillance Code: Privacy concerns Code: Security threat	Subcategory: Use of data for other ends than those agreed upon Code: Importance of building trust	Subcategory: Lack of interest in participation Code: Time-consuming Code: Unsure why it matters, lack of interest in public life Code: Complexity

3.2 Document analysis

Document analysis of organizational and institutional documents is considered a staple in qualitative research (Bowen, 2009). My document analysis offered me necessary background and context to inform my research (Bowen, 2009).

The documents that were analyzed are the Montreal Smart City Proposal to the Canadian Smart City Challenge, the Défi des villes intelligentes [Smart City Challenge] newsletter (only available in French) from the City of Montreal, the documents available online from the LIUM and the documents obtained with the key words "*ville intelligente*" [smart/intelligent city] from Montreal's open data portal. Additionally, I analyzed the content of the posts of the LIUM on Medium, a popular blogging platform (excluding job postings).

3.3 Ethical considerations and positionality

I received authorization on July 15th, 2019 from the Research Ethics Board I (REB) of McGill University to conduct my research. Participants had the option to be anonymous and could choose to not be recorded. I obtained their written consent. Due to unforeseen events, the COVID-19 pandemic, I was unable to retrieve the signed participant consent forms to consult them. For this reason, I decided to anonymize all my interviewees.

Regarding my positionality, the nature of my researcher-researched power dynamics with my participants was skewed in their direction, as I am conducting research on older people with decision-making authority in their respective projects. I noted no noticeable cultural differences, as I was able to conduct the interviews in either French or English with my participants.

3.4 Conclusion

In this chapter, I have presented the two methods that I used to conduct my research, namely semi-constructed interviews and document analysis. In addition, I presented my process for coding the data. I have subsequently reflected upon ethical considerations my positionality in conducting this research

Chapter 4: Results and Discussion

In this chapter, I present my research results and discuss the findings. As a reminder, the aim of my research is to investigate how participation and inclusion in smart city projects in Montreal, Canada, are defined and operationalized, and to examine what level of decision-making power the city residents will have over these projects. I am also interested in the role of personal data collected in smart city projects in participation and inclusion respectively.

4.1. First research question

My first research question is: How is participation defined and operationalized in Montreal's smart city projects? To answer this question, I draw on my two methods: interviews and document analysis. My document analysis mainly offered me necessary background and context to inform my research (Bowen, 2009).

4.1.1 Participation and the Public

Coding for participation, I retrieved the composition of participants and reason for participation as subcategories. The composition of participants was defined differently for each interviewee, as participants and participations were defined differently. On the composition of participants, interviewees considered the inclusion of different groups (e.g., different age groups, different socio-economic groups, different geographic location and different ethnicity) in proposed smart city projects. It remains unclear if they, as Quick and Feldman (2011) stated, perceived that participation and inclusion are different and complementary ways of engaging diverse populations. Helping the city save money, being a better citizen and achieving a better quality of life emerged as reasons for participation. The coding of the interviews did not yield results that I could use to answer my first research question. These results did not help me see how civic participation or participatory citizenship were operationalized in my interviewee's smart city projects.

Participation to each project is defined differently by each interviewee based on who the project's participants are. The results are displayed in Table 1.

Table 3: Summary of interviewee's answers to questions regarding participation

Participant ID	**Public participating?**	**Definition of the public for project**	**Definition of participation in project**	**Project benefits from public participation?**
A1	No	Anyone using the streets of Montreal	People complaining of rule breaks.	Yes, city better understand dockless vehicles .
B2	No, but in the future yes.	Foundations with funds to allocate	Through researchers, community organizations, city administrators	Yes, through community organizations
D4	Yes	General public	Community contribution, networking, information sharing and practice of sustainable mobility	Yes
E1	Yes	Public servants and citizens	Participation of the public servants	Yes, through the benefits of open procurement
F5	No	Anyone with an interest for open data	Not defined yet	Yes, if no one wanted to access open data the

				project would be useless.
S3	No, maybe later	Students, companies, researchers	Sharing of data and requesting of data	Yes, indirectly. Ultimately, the mobility of the general public will be improved.
G6	No	Clients	Being a paying costumer	Yes, feedback loop that helps improve the service.

These differences in how participation is defined makes it hard to find consistency in how participation is defined and articulated across projects. Participation in the project and public participation are two different things and there is inconsistency across interviews, and interview questions, as to which "participation" is discussed. As an example, in B2, where the project is a tool that would combine qualitative and quantitative data for a better understanding of Montreal and its population, B2 said that the public is not yet participating in the project. In this case, B2 refers to participation in the decision-making process of that project. In D4, where the project is a data valorization project on mobility, the interviewee said that public was participating in the project. In this instance, the participant referred to participation as participation in the project and not civic participation. In my literature review, I previously operationalized participation as participation in determining the plan or the program (Arnstein, 1969). In addition, it is worth noting that putting together the definitions of "public" and "participation" retrieved from each interview does not always match the definition of "public participating".

The public, in each respective smart city project, was defined differently by each interviewee, as shown in Table 1. Three mains categories of definitions emerged, as

displayed in Table 2, the public as the direct users/actors in the project (users and clients), the public as citizens (city residents) and the public as everyone.

One interviewee (E1), working on a community support program for municipalities on smart cities, said that:

> I would not necessarily tie participation to public participation, I would talk about participation of the public officials [..] And I think public is also, in the context of this interview, public citizens. (E1 transcript).

Another one (B2), developing a tool that would combine qualitative and quantitative data for a better understanding of Montreal and its population, expressed that:

> The initial public is first and foremost actors in the heads of foundations. For example, the McConnell Foundation, the Saputo Foundation, the Chagnon Foundation. Foundations that have funds that they want to allocate to projects. (B2 transcript).

I now want to shift from preconditions to levels of participation that suggest influence in decision making. The public participation of actors that are not directly the citizens makes comparison to Arnstein's ladder of citizen participation difficult. From that, I conclude that it is unclear if and/or how the city residents will be able to engage in participation in the projects, in other words in the decision-making process. Thus, reporting on the level of decision-making power citizens will have in these projects is not possible at the time.

If I broaden the concept of citizen to include more actors, then I could use the ladder. Actors like government officials are still included in the ladder as, for example, they are the ones informing the citizens. Table 4 shows in which type, and level of the ladder, the actors, defined as the public in each interview, are engaged. I am interested in the participation of the actors in the projects, and my results are based on my interviews.

Table 4: Participation of the actors in the projects, based on Arnstein's ladder

Participant ID	**Definition of the public for project, actors who are engaged in participation**	**Participation type or rung**	**Participation level**

A1	Anyone using the streets of Montreal	Therapy	Nonparticipation
B2	Foundations with funds to allocate	Partnership	Citizen power
D4	General public	Informing	Tokenism
E1	Public officials and citizens	For public officials: informing For citizens: informing	Tokenism
F5	Anyone with an interest for open data	Informing	Tokenism
S3	Students, companies, researchers	Not enough information to determinate precisely between informing and consultation	Tokenism
G6	Clients	Informing and consultation	Tokenism

From Table 3, it emerges that all participants, defined by the interviewee, are engaged in levels of participation identified as non-participation, except B2 who got citizen power, in relation to the smart city project. The implications of this seems to be that the smart cities

projects are planned in a top-down approach, where participants do not yield decision-making power. I now proceed to the same exercise with the IAPP's table on civic participation (see Table 5).

Table 5: Participation of the actors in the projects, based on the IAPP's classification

Participant ID	**Definition of the public for project, actors who are engaged in participation**	**Form of participation**
A1	Anyone using the streets of Montreal	Informing
B2	Foundations with funds to allocate	Not enough information to determinate precisely between consulting and involve
D4	General public	Informing
E1	Public officials and citizens	For public officials: informing For citizens: informing
F5	Anyone with an interest for open data	Informing
S3	Students, companies, researchers	Not enough information to determinate precisely between informing and consulting

G6	Clients	N/A

For G6, the form of participation is not applicable in the IAPP's table, as it would be "below" informing. The goal of public participation goal of informing is to "provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions" (IAPP, 2005), but as the company G6 works for is a for profit private company, and the public for their project is defined as their clients, their paying customers, I doubt they provide "balanced and objective information" to assist their clients in understanding "alternatives" to their product/service of dockless vehicles. From Table 5, it also emerges that all participants, defined by the interviewee, are engaged in low forms of participation, except B2 whose public is involved in consulting/involving. In addition, it is also unclear if and/or how the citizens will be able to engage in participation in the projects, as the public for the project is not the citizens. In consequence, reporting on the level of decision-making power citizens will have in these projects remains not possible at the time.

In conclusion, while I reported on how participation is defined and operationalized in Montreal's smart city projects, it is hard to conclude anything at this time. Who participated, in other words who the public was for each project, was differently defined and thus, no comparison on how the city's residents would participate in each project could be extracted.

4.2 Second research question

My second research question was: What is or will be the role of personal data collected in smart city projects in participation and inclusion respectively? To address this question, I consider how the data is collected, the active or passive nature of the data and how its collection offers possibilities for participation and inclusion. The coding of the interviews did not yield results that I could use to answer my second research question, mainly

because the terms participation and inclusions were conceptualized so differently from project to project, and so thematic coding did not make sense in this context.

4.2.1 Role of passive data in inclusion

First, none of the projects my interviewees worked on was involved in data collection, except for G6. When asked about the role of passive data in inclusion, here is what the participants shared. A1 expressed that:

> The advantage is that passive data is the best way to limit the exclusion issues. When it is active, there is always a risk that people will not participate and often it will be certain profiles of people who will not participate. (A1 transcript).

The interviewee B2 shared that he had difficulty linking the two concepts and that he had not thought about this question from this angle. D4 replied by saying that the role of passive data was important for analysis and ultimately making decisions. He did not elaborate on his answer more. The participant E1 explained that:

> It depends what data you are collecting and whether or not the data allows you to have meaningful analysis to better understand inclusion. […] I cannot really answer that, because I have not seen the data.

The interviewee F5 said that:

> I tend to say that passive data is not necessarily judgmental, it's not able to exclude someone, it's really based on what's going on in the field. Of course, after that, one might wonder whether passive data are collected only in places where certain populations are over-represented, perhaps, but that is not the intention. (F5 transcript).

On the role of passive data in inclusion, the participant S3 expressed that:

> Several aspects [are important], if we talk about generational inclusion, it's very difficult, because if you do counting, you're not able to know. But if we talk about geographic inclusion, for example, yes, because we're going to make sure we put sensors all over the city. So, I really think it's case by case. There's a part that it's very important, but there's another part that we cannot control in relation to inclusion. (S3 transcript).

Finally, G6 said that he did not see how it applied to his project.

From these results, I conclude that it seems that passive data is viewed as the best way to limit exclusion (A1), but it is limited to certain types of exclusion (S3), as, based on the context, some facets of inclusion are hard to capture passively (S3).

What interviewee A1 shared about the risk of active data in inclusion, "there is always a risk that people will not participate and often it will be certain profiles of people who will not participate" (A1 transcript), echoes what the literature on the advantages of passive participation says about increasing the number of participants and reducing the respondent's burden (Chen et al., 2010).

A1 expressed that passive data collection allows for a targeted approach to inclusion. He gave the example of implementing air pollution sensors in lower socio-economic neighborhoods, in which case the citizens of these neighborhoods are targeted for data collection, but without demanding extra work for them. This time and/or energy constraint to the inclusion of citizens of lower socio-economic background is often present in the literature as well (Monhanty and Tandon, 2006.).

There is the belief that data collected passively is "neutral" (F5), that is does not discriminate, although the interviewee noted that where the data collection occurs can cause some populations to be over-represented. Another participant (S3) noted that, while you can change things at the implementation stage, once the data starts to be collected passively, you cannot force inclusion, as the data will simply be a representation of what happens on the ground. From that, I conclude that there is an understanding that it is important to think about inclusion prior to the implementation stage, because this is where the biases will occur, as data collection in itself is perceived as having a certain neutrality to it.

My conclusion is that while it is impossible to make a generalization, citizen's passive data, when harvested for various projects, is viewed as having a positive impact on inclusion, as it can mitigate some of the reasons why marginalized people are not engaging in traditional forms of civic participation.

4.2.2 Role of passive data in participation

When asked about the role of passive data in participation, here is what the participants shared. B2 expressed that any passive data that they are able to retrieve, store and use is going to be beneficial. D4 said that:

In fact, this is the biggest part for us, in mobility. In other things, it would not be true, but for [mobility] it is. That being said, afterwards, to make choices, choices of solutions, we will be in the active data. (D4 transcript).

Responding to this question, participant E1 explained that:

> Passive data in a smart city is huge. That's the whole thing, right? And so, I am not sure that passive data directly leads to participation. I think there is a lot of passive data, there is a lot of data that is passively collected by public administration that probably … that citizens do not have a lot of awareness that that data is being collected in the first place. Whether or not passive data could be better understood, and if people knew that there was a lot of data being collected passively, could that lead to more participation? Perhaps. (E1 transcript).

Interviewee F5 expressed that:

> It's hard to say, yes there a part passive data [in participation], but it's often anonymous. That's one of the issues we're looking at, in terms of data, in the Intelligent Cities Challenge. […] That is precisely the role of passive data in participation [...] without realizing it, yes, citizens participate in an intelligent city project, because they themselves are connected and circulate [...].

The participant S3 said the role of passive data in participation is very important in mobility. Finally, G6 expressed that he did not see how the question was relevant to his project. The interviewee A1 did not reply to the answer because I skipped it accidentally.

The role of passive data in participation has been identified as of important significance by many participants. Interviewee D4 expressed that while passive data was the biggest part for them in mobility, to make decisions, they would rely on active data. This is very interesting as it suggests that decision-making, in this case, would require citizen's active data, in other words, data that you have cannot collect without them knowing (e.g.:

surveys). It seems that D4 suggested that "sensing the citizens" through static inert sensors or sensors carried by humans is not considered enough to be participation, but that the engagement of "humans as sensors", for example, by someone asking the citizen their opinion via a survey (active data) is needed to make-decisions.

This is somewhat contradictory to Chen et al. (2010), who argue, that in transportation, passive data collection methods may replace conventional surveys. My conclusion is that the role of citizen's passive data in participation, defined in this thesis as involvement decision-making, is somewhat unclear. It remains uncertain if my interviewees consider the collection of citizen's data as involvement in decision-making, and if the type of that collected data, passive or active, matters in determining if it constitutes participation in the decision-making process.

4.3. Conclusions

I begin with my first research question, which is: How is participation defined and operationalized in Montreal's smart city projects? I find that my interviewees understood participation to their project as participation from actors involved in their project and/or participation as participation from the city residents in their project. Of course, participation of actors in the project and public participation are two different things and there was confusion across interviews, and interview questions, as to which "participation" is discussed. In a similar fashion, who is the public for each project was also understood differently across interviews.

The public participation of actors that are not directly the citizens makes comparison to Arnstein's ladder of citizen participation and the IAPP's classification difficult. From that, I conclude that it is unclear if and/or how the city residents will be able to engage in participation in the projects, in other words in the decision-making process. Thus, reporting on the level of decision-making power citizens will have in these projects is not possible. Then, I compared both classifying tools against the actors engaged in participation for each project, in how their current relation to participants can be classified. For Arnstein's ladder, it emerges that all participants, defined by the

interviewee, are engaged in levels of participation identified as non-participation, except B2 who got citizen power, in relation to the smart city project. For the IAPP's table, I also found that all participants, defined by the interviewee, are engaged in low forms of participation, except B2 whose public is involved in consulting/involving.

For my second question about the role of citizen's data in participation and inclusion, I wanted to consider how the data is collected and how it is used by to inform participation and inclusion by people working on smart city projects in Montreal. To answer this question, I also consider the interviews directly as the coding was not successful/adapted to the interviews, as each participant used different definitions of terms to answer my questions. For inclusion, I conclude that while it is impossible to make a generalization, citizen's passive data, when harvested for various projects, is viewed as having a positive impact on inclusion, as it can mitigate some of the reasons why marginalized people are not engaging in traditional forms of civic participation. For participation, I conclude that the role of citizen's passive data, defined in this thesis as involvement decision-making, is somewhat unclear. It remains uncertain if my interviewees consider the collection of citizen's data as involvement in decision-making, and ultimately, if the type of that collected data, passive or active, matters in determining if it constitutes participation in the decision-making process for each of their projects.

With time and the perspective, I believe that my interview questions could have been worded differently or changed all together to yield better, more pointed results. I think that giving participants definitions of the terms used in each question could have avoided me a lot of trouble in terms of distinguishing answers that are comparable from project to project.

In addition, since I ended up researching smart city projects that are not yet completed, proposed smart city projects, some interviewees did not know yet how the public participate in their projects. I speculate that this exercise would be better off if completed when the smart city projects are in operation.

Chapter 5: Conclusions

Throughout my research I have attempted to answer my two research questions:

1. How is participation defined and operationalized in Montreal's smart city projects?
2. In Montreal's smart city projects, what is the role of citizen's data in participation and inclusion?

I started by looking at the literature on civic participation and the smart city. From there, I outlined my methodology, the reasons why I chose those methods and a reflection my positionality. I then looked at my results and discussed them. While I ultimately was not conclusively able to answer my research questions in this thesis, I believe that investigating how participation and inclusion are defined and operationalized, and to examine what level of decision-making power the city residents will have over these projects, remains extremely important to the success of Montreal in creating "smart" urban solutions adapted to its reality.

Reference list

Ahas, R., Siiri, S., Olle, J., E., Saluveer, &T., Margus. (2010). Using Mobile Positioning Data to Model Locations Meaningful to Users of Mobile Phones, *Journal of Urban Technology*, 17, 3-27. 10.1080/10630731003597306.

Akintoye A., Hardcastle C., Beck M., Chinyio E. & Asenova D. (2003) Achieving best value in private finance initiative project procurement, *Construction Management and Economics*, 21(5), 461-470, 10.1080/0144619032000087285.

Albaum, G. (1997). The Likert Scale Revisited. Market Research Society. *Journal*., 39(2), 1–21. https://doi.org/10.1177/147078539703900202.

Albino., Berardi U., & Dangelico, R-M. (2015). Smart Cities: Definitions, Dimensions, Performance, and Initiatives, *Journal of Urban Technology*, 22(1), 3-21, https://doi.org/10.1080/10630732.2014.942092.

Allam, Zaheer & Dhunny, Zaynah A. (2019). On big data, artificial intelligence and smart cities, *Cities, 89*, 80-91, https://doi.org/10.1016/j.cities.2019.01.032.

Allwinkle, S., & Cruickshank, P. (2011). Creating Smart-er Cities: An Overview, *Journal of Urban Technology*, 18(2), 1-16, DOI: 10.1080/10630732.2011.601103.

Atzori, L., Iera, A., & Morabito, G. (2010). The Internet of Things: A survey. *Computer Networks*, 54(15), 2787–2805. https://doi.org/10.1016/j.comnet.2010.05.010.

Arnstein, Sherry R. (1969). A Ladder of Citizen Participation, *Journal of the American Institute of Planners, 35(4),* 216-224. DOI: 10.1080/01944366908977225.

Barnes, T.J. (2017). *Retheorizing Economic Geography: From the Quantitative Revolution to the "Cultural Turn"*, Vancouver, Canada. Routledge.

Bickerstaff, K., & Walker, G. (2001). Participatory local governance and transport planning, *Environment and Planning A*, 33(3), 431-451. https://doi.org/10.1068/a33173.

Bloomberg Business. (2019, November 11). *Global Smart Cities Market Size is Expected to Reach 252.56 Billion US$ by the End of 2025, With a CAGR of 16.53% Between 2019.* https://www.bloomberg.com/press-releases/2019-11-11/global-smart-cities-market-size-is-expected-to-reach-252-56-billion-us-by-the-end-of-2025-with-a-cagr-of-16-53-between-2019.

Meijer, A., & Bolívar, M. P. R. (2016). Governing the smart city: a review of the literature on smart urban governance. International Review of Administrative Sciences, 82(2), 392–408. https://doi.org/10.1177/0020852314564308.

Boyatzis, R.E. (1998). *Transforming Qualitative Information.* SAGE Publications, Inc.

Bowen, G. (2009). Document Analysis as a Qualitative Research Method. Qualitative Research Journal. 9. 27-40. 10.3316/QRJ0902027.

Brabham, D. C. (2009). Crowdsourcing the Public Participation Process for Planning Projects. *Planning Theory*, *8*(3), 242–262. https://doi.org/10.1177/1473095209104824.

Brauneis, R. & Goodman, E.P. (2018). Algorithmic Transparency for the Smart City, *20 Yale J. of Law & Tech*, 103. http://dx.doi.org/10.2139/ssrn.3012499.

Bruenner, R. (2017, January 27). *Former Montreal mayor Michael Applebaum found guilty of corruption and fraud charges*. Montreal Gazette. https://montrealgazette.com/news/local-news/former-montreal-mayor-michael-applebaum-found-guilty-of-corruption-and-fraud-charges.

Caragliu, A., Del Bo, C., & Nijkamp, P. (2009). Smart cities in Europe. *3rd Central European Conference in Regional Science*, 18:48, 45–59. 10.1080/10630732.2011.601117.

Castelnovo, W., Misuraca, G., & Savoldelli, A. (2016). Smart Cities Governance: The Need for a Holistic Approach to Assessing Urban Participatory Policy Making. *Social Science Computer Review*, *34*(6), 724–739. https://doi.org/10.1177/0894439315611103.

Chen, C., Gong, H., Lawson, C. & E. Bialostozky. (2010). Evaluating the feasibility of a passive travel survey collection in a complex urban environment: Lessons learned from the New York City case study, *Transportation Research Part A: Policy and Practice*, 44(10), 830-840, https://doi.org/10.1016/j.tra.2010.08.004.

Chourabi, H., Nam, T., Walker, S., Gil-Garcia, J. R., Mellouli, S., Nahon, K., & Pardo, T., & Scholl, H. (2012). Understanding Smart Cities: An Integrative Framework. 4*5th Hawaii International Conference on System Sciences*. 2289-2297. 10.1109/HICSS.2012.615.

Ching, T. Y., & J. Ferreira. (2015). Smart cities: Concepts, perceptions and lessons for planners. In Planning support systems and smart cities, ed. S. Geertman, J. Ferreira, Jr., R. Goodspeed, and J. Stillwell, 145–68. Cham, Switzerland: Springer.

Clifford, N., Cope, M., Gillespie, T., & French S. (2016). *Key Methods in Geography*. SAGE Publications, Inc.

Cooper, J.I. (1969). *Montreal: A Brief History*. Montreal, Canada: McGill-Queens University Press.

Dameri, R. P., & Benevolo, C. (2016). Governing Smart Cities: An Empirical Analysis. *Social Science Computer Review, 34(6),* 693–707. https://doi.org/10.1177/0894439315611093.

Davies, S.R., Selin, C., Gano, G. & Â. Guimarães Pereira. (2012). Citizen engagement and urban change: Three case studies of material deliberation, *Cities*, 29(6), 351-357. https://doi.org/10.1016/j.cities.2011.11.012.

Dunn, K. (2000). Interviewing. In I. Hay (Ed.), *Qualitative research methods in human geography*. Oxford, UK: Oxford University Press.

Eger, J. M. (2009). Smart growth, smart cities, and the crisis at the pump a worldwide phenomenon. *I-Ways*, 32(1), 47-53.

Examples of Transcribed Interviews. (2018), IndianScribes. Retrieved from https://www.indianscribes.com/example-transcript/.

Florida, R. (2004). *The Rise of the Creative Class: A Toolkit for Urban Innovators*, New York: Basic Books.

Gauthier, M. (2003). The inadequacy of concepts: the rise of youth interest in civic participation in Quebec, *Journal of Youth Studies*, 6(3), 265-276, https://doi.org/10.1080/1367626032000138255.

Granier, B & H. Kudo. (2016). How Are Citizens Involved in Smart Cities? Analysing Citizen Participation in Japanese "Smart Communities'". *Information Polity*, 21(1), 61-76, DOI: 10.3233/IP-150367.

Goodchild, M.F. (2007). Citizens as sensors: the world of volunteered geography, *GeoJournal*, 69, 211-221. https://doi.org/10.1007/s10708-007-9111-y.

Grineski S., Bolin B. & Boone C. (2007). Criteria Air Pollution and Marginalized Populations: Environmental Inequity in Metropolitan Phoenix, Arizona. *Social Science Quarterly.* 88 (2), 535-554. https://doi.org/10.1111/j.1540-6237.2007.00470.x.

Hannabuss, S. (1996). Research interviews, *New Library World*, 97(5), 22-30. https://doi.org/10.1108/03074809610122881.

Head, B.W. (2007). Community Engagement: Participation on Whose Terms?, *Australian Journal of Political Science*, 42(3), 441-454, DOI: 10.1080/10361140701513570.

Hollands, Robert G. (2008). Will the real smart city please stand up?, *City*, 12(3), 303-320. https://doi.org/10.1080/13604810802479126.

Holton, J. A. (2010). The Coding Process and Its Challenges. *The Grounded Theory Review*, *9*(1), 21–40. http://dx.doi.org/10.4135/9781848607941.n13

International Association for Public Participation. (2005). Public Participation Spectrum. Retrieved from http://iapt2.org.

Keating M. (1998) Commentary: Public-Private Partnerships in the United States from a European Perspective. In: Pierre J. (eds) *Partnerships in Urban Governance*. Palgrave Macmillan, London. https://link.springer.com/chapter/10.1007/978-1-349-14408-2_9#citeas.

Kelly, D. C. (2009). In Preparation for Adulthood: Exploring Civic Participation and Social Trust Among Young Minorities. *Youth & Society*, *40*(4), 526–540. https://doi.org/10.1177/0044118X08327584.

Khansari, N., Mostashari, a., & Mansouri, M. (2013). Impacting Sustainable Behaviour and Planning in Smart City, *International Journal of Sustainable Land use and Urban Planning*, 1(2), 46-61.

Khan, Z. & Khani, S.L. (2012). A Cloud-Based Architecture for Citizen Services in Smart Cities, 2012 IEEE Fifth International Conference on Utility and Cloud Computing, 315-320. DOI: 10.1109/UCC.2012.43.

Lee, S., Yigitcanlar, T., Han, J., & Leem, Y. (2008). Ubiquitous urban infrastructure: Infrastructure planning and development in Korea. *Innovation: Management, Policy & Practice*, 10(2-3), 282-292.

Lombardi, P., Giordano, P., Farouh, H. & W. Yousef. (2012). Modelling the smart city performance, *Innovation: The European Journal of Social Science Research*, 25(2), 137-149, DOI: 10.1080/13511610.2012.660325.

LIUM. (n.d). About. Retrieved from https://laburbain.montreal.ca/en/about.

Maps of Montréal. (n.d). Ville de Montréal. http://ville.montreal.qc.ca/portal/page?_dad=portal&_pageid=5977,41729560&_schema=PORTAL.

Mark Deakin & Husam Al Waer (2011) From intelligent to smart cities, *Intelligent Buildings International,3(3),* 140-152, https://doi.org/10.1080/17508975.2011.586671.

Monhanty, R., & Tandon, R. (2006). *Participatory Citizenship: Identity, Exclusion, Inclusion*. SAGE Publications, Inc. https://us.sagepub.com/en-us/nam/participatory-citizenship/book229415.

Moser S., Fauveaud G. & Cutts. A. (2019). Montréal: Towards a post-industrial reinvention, *Cities*, 86, 125-135. https://doi.org/10.1016/j.cities.2018.09.013.

Nam, T., & Pardo, T. A. (2011). Smart city as urban innovation: Focusing on management, policy, and context. *Proceedings of the 5th international conference on theory and practice of electronic governance*, Tallinn, Estonia, 26–28 September 2011. http://dl.acm.org/citation.cfm?id=2072100.

Lauriault P., Tracey & Bloom, Rachel & Livingstone, Carly & Landry, Jean-Noé. (2018). Open Smart Cities in Canada: Environmental Scan and Case Studies - Executive Summary. 10.31235/osf.io/e4fs8.

Pokorny, S. B., Jason, L. A., Schoeny, M. E., Townsend, S. M., & Curie, C. J. (2001). Do Participation Rates Change when Active Consent Procedures Replace Passive Consent. *Evaluation Review*, *25*(5), 567–580. https://doi.org/10.1177/0193841X0102500504

Quartiers de Montréal. (n.d.) Fiatlux. http://local.fiatlux.tk/montreal/quartiers.

Quetzal Tritter J. & A. McCallum. (2006). The snakes and ladders of user involvement: Moving beyond Arnstein, *Health Policy*, 76(2), 156-168. https://doi.org/10.1016/j.healthpol.2005.05.008.

Quick, K. S., & Feldman, M. S. (2011). Distinguishing Participation and Inclusion. *Journal of Planning Education and Research, 31(3)*, 272–290. https://doi.org/10.1177/0739456X11410979.

Roberts, N. (1997). Public Deliberation: An Alternative Approach to Crafting Policy and Setting Direction. *Public Administration Review, 57*(2), 124-132. DOI:10.2307/977060.

Rowe, G., & Frewer, L. J. (2000). Public Participation Methods: A Framework for Evaluation. Science, *Technology, & Human Values*, 25(1), 3–29. https://doi.org/10.1177/016224390002500101

Sajhau, P. (2017). IBM – Building sustainable cities through partnerships and integrated approaches, *Field Actions Science Reports*, 16, 52-57. http://journals.openedition.org/factsreports/4345.

Sarma, A. (2016). Smart City and Urban Sustainability. All India Seminar on Tackling Urban Environmental Concerns in Upcoming Smart Cities of our Country. 10-17. https://www.researchgate.net/publication/311305264_smart_city_and_urban_sustainability.

Saldana. J. (2009). *Chapter 1: An introduction to codes and coding*. SAGE Publications, Inc. https://www.sagepub.com/sites/default/files/upm-binaries/24614_01_Saldana_Ch_01.pdf

Satander on Fire. (n.d). Smart Satander. https://www.smartsantander.eu.

Savoldelli, A., Misuraca, G. & Codagnone,C. (2013). Measuring the Public Value of e-Government: The eGEP2.0 model, *The Electronic Journal of e-Government, 211(21),* 373-388.

Shelton, T., & Lodato, T. (2019). Actually existing smart citizens, *Cities*, 23(1), 35-52, 10.1080/13604813.2019.1575115.

Susskind L. & Elliott M. (1983). Paternalism, Conflict, and Coproduction Learning from Citizen Action and Citizen Participation in Western Europe. Environment, Development, and Public Policy. Boston, MA: Springer.

Statistics Canada. (2017). *Montréal, Quebec and Canada*. *Census Profile*. 2016 Census. Statistics Canada Catalogue no. 98-316-X2016001. https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E.

Universal Declaration of Human Rights. (1948, December 10). United Nations. https://www.un.org/en/universal-declaration-human-rights/.

Viitanen J. & Kingston R. (2014). Smart cities and green growth: outsourcing democratic and environmental resilience to the global technology sector, *Environment and Planning*, 46, 803–819, doi:10.1068/a46242.

Waters, J. (2015). Snowball sampling: a cautionary tale involving a study of older drug users, *International Journal of Social Research Methodology*, 18(4), 367-380, DOI: 10.1080/13645579.2014.953316.

Welch, E. W. (2012). The relationship between transparent and participative government: A study of local governments in the United States. *International Review of Administrative Sciences*, 78(1), 93–115. https://doi.org/10.1177/0020852312437982

Wiig, A. (2015). The empty rhetoric of the smart city: from digital inclusion to economic promotion in Philadelphia, *Urban Geography*, 37(4), 535-553. https://doi.org/10.1080/02723638.2015.1065686.

Wilhelm Siegfried Ruhlandt, Robert. (2018). The governance of smart cities: A systematic literature review, *Cities*, *81,* 1-23, https://doi.org/10.1016/j.cities.2018.02.014.

Xing J., Sieber R. & Roche S. (2019) Rethinking Spatial Tessellation in an Era of the Smart City, A*nnals of the American Association of Geographers*, DOI: 10.1080/24694452.2019.1662766.

Zoonen, L. (2016) Privacy concerns in smart cities, *Government Information Quarterly*, 33(3), 472-480, https://doi.org/10.1016/j.giq.2016.06.004.